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ABSTRACT

This guide is designed to help classroom teachers implement the Alabama Course of Study: Mathematics K-12. It is inclusive also of the objectives tested by the Stanford Achievement Tests and the Alabama Basic Competency Tests. One characteristic of the curriculum guide is that it clearly states what students should learn in each grade level. These objectives are called student outcomes and appear in the table of contents. The majority of the material, however, consists of classroom activities that lead students to the desired outcomes. The curriculum guide specifies what to teach as well as ways to teach it. Each section of the guide contains a specific table of contents, which lists what students should learn; activities; original sources; and student outcomes. Activities are preceded by a description of the area of mathematics covered, the specific student outcomes that are addressed in the activities, and notes for the teacher, which convey information important for effectively carrying out the activities. Topics include banks and their services, consumer credit, housing, insurance, probability, statistics, money management, savings, investments, taxes, swindles, gyps, and transportation. (KR)

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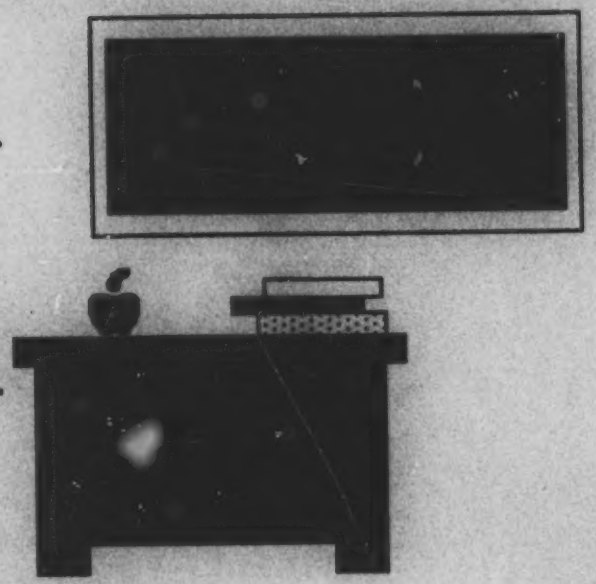
CONSUMER MATHEMATICS



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Bulletin 1987, No. 49

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State Superintendent of Education
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MATHEMATICS
CURRICULUM GUIDE
CONSUMER MATHEMATICS

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FOREWORD

This Mathematics Curriculum Guide: Consumer Mathematics is designed to help classroom teachers implement the Alabama Course of Study: Mathematics K-12 (Bulletin 1984, No. 16). One characteristic of the curriculum guide is that it clearly states what students should learn in Consumer Mathematics. These are called STUDENT OUTCOMES and appear in the Table of Contents. The majority of the material, however, consists of classroom ACTIVITIES that lead students to the desired outcomes. The curriculum guide, then, specifies what to teach as well as ways to teach it.

The Mathematics Curriculum Guide: Consumer Mathematics is supplemental in nature. It will add to material found in textbooks and complement locally developed skills continuums, scope and sequences, and/or curriculum guides. In the past, we have been most successful when we clearly defined what students should learn, gave examples of how it can be taught, and then tested for mastery. This curriculum guide is another step in that direction.

Wayne Teague

Wayne Teague
State Superintendent of Education

INTRODUCTION

The Mathematics Curriculum Guide: Consumer Mathematics is one of a series of curriculum guides to be developed by the Alabama State Department of Education. Its production is part of a larger plan to provide LEAs with a curriculum guide in every subject area K-12, immediately following the Course of Study adoption in the same subject area. The Mathematics Curriculum Guide K-6 is packaged separately. Each of the other secondary mathematics guides (Math - Grades 7 and 8, General Math, Pre-Algebra, Algebra I, Geometry, Algebra II, Trigonometry/Analysis, and Applied Vocational Math will be packaged separately also and will be published shortly.

The Consumer Mathematics guide has three distinct sections. It begins with a TABLE OF CONTENTS which lists what students should learn (student outcomes) in Consumer Mathematics. After each outcome, a page number(s) directs the reader to classroom activities that address the specific outcome.

The second and largest section of the guide consists of classroom ACTIVITIES. Activities are preceded by a description of the area of Consumer Mathematics, the specific student outcomes that are addressed in the activities, and Notes for the Teacher that convey information important for effectively carrying out the activities.

The third section is referred to as the ORIGINAL SOURCES AND STUDENT OUTCOMES portion of the guide. It summarizes the relationship of student outcomes to the original sources from which the outcomes were taken. (The original source for the Mathematics Curriculum Guide: Consumer Mathematics outcomes was the Alabama Course of Study.) This section of the guide will serve as a reference for local school systems that may wish to trace the source of each outcome or to rate each outcome as being basic, standard, or advanced.

The use of the Mathematics Curriculum Guide: Consumer Mathematics is not mandatory. Instead, it is offered as material that will help implement the Mathematics Course of Study and prepare students for the Stanford Achievement Tests. The Mathematics Curriculum Guide: Consumer Mathematics can be used as it is in LEAs that currently have no guide, or it can serve as a starting point for developing a similar guide locally. In either case, the involvement of local educators in the development of curricula is valued and encouraged. It is hoped that this guide will bring about local expansion activities such as writing outcomes for "optional" mathematics courses; adding to the list of outcomes for a given subject; writing additional activities in specific areas of identified weakness; rating outcomes as basic, standard, or advanced; and developing uniform end-of-unit tests.

ACKNOWLEDGEMENTS

From its inception, the development of curriculum guides has been viewed as a cooperative effort between specialists in the Division of Student Instructional Services and selected classroom teachers from the public schools of Alabama. The Curriculum Development Section, under the leadership of Katherine Mitchell, has the responsibility for coordinating this project.

Work on the Mathematics Curriculum Guide: Consumer Mathematics started in January 1986, when Linda G. Harris was selected as Project Director and the identification of student outcomes began. The second phase of the project took place during July and August when five classroom teachers joined State Department of Education specialists in the writing of activities that teach the identified outcomes. For twelve days the following teachers offered their best ideas:

James Davidson - Jasper City Schools
Patricia Edwards - Etowah County Schools
Myrtle Johnson - Eufaula City Schools
Ann Lilly - Tuscaloosa City Schools
Wanda Motes - Enterprise City Schools

Over a period of eleven months, a team of State Department of Education specialists identified and reviewed student outcomes, wrote and rewrote activities, read activities for clarity, and proofed various drafts. Jack Blucert helped us by providing activities with a Career Education emphasis, and Mary Jane Herring edited most of the guide. Robin Lanier contributed the graphics; Brondena Ferguson was the primary typist for the document. Special thanks are also due Mrs. Loette Lee, Mathematics Supervisor in the Montgomery County Schools, who helped us write student outcomes that are consistent with the intent of the Alabama Course of Study. We appreciate the work of all these people and their co-workers, who made the adjustments and sacrifices necessary to carry out their own programs and, at the same time, made the Mathematics Curriculum Guide: Consumer Mathematics a division product.

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AREA: BANKS AND THEIR SERVICES

OUTCOMES:
1. Distinguish among commercial banks, savings and loan associations, and credit unions.
2. Describe and demonstrate knowledge of basic services such as checking and savings accounts.
3. Compare interest rates on savings accounts.
4. Determine charges or interest on checking accounts and special features such as an overdraft protection and incentive-based accounts.

NOTES FOR THE TEACHER

Prerequisite for Students

1. Add, subtract, multiply, and divide whole numbers, fractions, decimals, and percents.

Steps to Success

1. Begin with an investigation of typical services offered by area banks and credit unions: loan services and savings accounts.

2. Point out that some "banks" are not really banks at all. Credit unions offer many of the same services as banks at a lower cost. They do not have the financial backing as most commercial banks, so they often do not finance home mortgages or make large loans.

3. Discuss less typical services provided by financial institutions such as setting up trust funds and retirement accounts.

ACTIVITY 1 - OUTCOME 1

Introduce students to the types of financial institutions in their community by asking questions similar to the following:

1. Which businesses in our community help people handle financial matters?
2. How many banks are in our community?
3. What services do banks provide?
4. Are there any savings and loan associations? Credit unions? Name them.
5. What are the similarities among banks, savings and loan associations, and credit unions?
6. What are the major differences among banks, savings and loan associations, and credit unions?
7. Are all banks the same?
8. Why are some banks called commercial banks and others called savings banks?

Initial discussions concerning banks and their services should set the tone for individual and/or group research. It is not as important for students to answer all questions as it is for students to sense what they know and do not know.

Following an initial discussion, provide students with an activity that generates answers to the questions raised. Activities could include some of the following:

1. Divide students into small groups. Have each group examine printed literature from a different financial institution in the community. Have each group determine the kind of financial institution that published the material and the types of services it provides.

2. Invite representatives from several different financial institutions (commercial bank, savings and loan association, mortgage company, trust company, credit union) to speak to the class.

   Prior to the visit of each representative, divide the class into small groups. Have each group determine a series of questions related to a specific topic. For example, one group could generate questions related to checking account services. (Is interest paid on checking account? Is there a service charge on checking accounts?) Other groups could generate questions related to investments, loans, savings, and other special services to clients.

   Invite the speaker to talk for a specified period of time. Explain to the speaker that he/she should be prepared to answer students' questions following the talk.

ACTIVITY 1 - OUTCOME 1 (Cont'd)

3. Assign students to visit a particular financial institution in the community. Prior to the visit discuss with students the proper procedures for arranging the visit. Before the visit, have students provide written information that ensures the visit has been properly planned. This written information should include the following:

   a. Name of institution to be visited
   b. Date and time of visit
   c. Person at the institution who arranged for the visit
   d. Person(s) to be talked with during the visit
   e. Specific questions to be answered during the visit

   Have students give oral reports following their visits.

ACTIVITY 2 - OUTCOMES 2 and 4

Ask a local bank to donate blank deposit slips and blank checks with stubs or ledgers. Following initial instruction related to writing checks and keeping an account of checks and deposits, provide a fictitious account of several money transactions performed over a period of a month. Have students complete an activity involving numerous steps using actual (or copies of actual) deposit slips, checks, and ledgers or stubs. Students should be asked to perform tasks similar to the ones found in the example below:

Example:

1. On September 6, the account has a checking balance of $870.45. Write this as the balance brought forward.

2. On September 8, a deposit of four $20 bills, eight $5 bills, six $1 bills, and a check in the amount of $441.96 is made. Fill out a deposit slip, and indicate the deposit on the check stub or ledger.

3. On September 9, a check should be written to Allison Jones for $243.87 for equipment purchases. Write the check, complete the ledger, and carry the balance down.

4. On September 15, a check should be written to Central Housing Authority for $368.50 for rent and utilities for the month. Write the check and complete the stub or ledger.

5. On September 22, a check should be written for groceries to the Saveway Supermarket for $124.66. Write the check and complete the stub or ledger.

ACTIVITY 2 - OUTCOMES 2 and 4 (Cont'd)

6. On September 28, a bank statement is received indicating a service charge of $3.46 and a credit of $1.38 interest earned on the balance of the account. What is the remaining balance to be brought forward?

Have each student create an example similar to the one above. Students should submit to the teacher the example and its proposed solution. When the teacher checks the examples for accuracy, they can be exchanged among the students in the class.

ACTIVITY 3 - OUTCOME 3

Introduce students to definitions of principal, interest, simple interest, and compound interest. Begin with problems involving the calculation of simple interest. Explain that simple interest is found by multiplying the principal by the rate by the time. Use an example similar to the one listed below for student practice. A step-by-step procedure similar to the solution can be helpful with beginners.

Example: Tom Jones deposited $125 into a savings account. It pays an annual interest rate of 5 1/2%. If Tom makes no further deposits or withdrawals, how much simple interest will be earned after 3 months? after 12 months?

Solution:

3 Months		12 Months	
Principal	$125	Principal	$125
Rate	5 1/2%	Rate	5 1/2%
Time	3 Mo. = 1/4 x 1 Year	Time	12 Mo. = 1 Year
Interest	$125 x 5 1/2% x 1/4	Interest	$125 x 5 1/2% x 1
Interest	$1.72	Interest	$6.88

ACTIVITY 3 - OUTCOME 3 (Cont'd)

Continue with examples that require students to calculate compound interest.

Example: Tom Jones deposited $125 into a savings account. The account earns 5 1/2% interest compounded quarterly. If Tom makes no further deposits or withdrawals, how much interest will be earned after 12 months?

Solution:

First Quarter		Second Quarter	
Principal	$125	New Principal	$126.72
Rate	5 1/2%	Rate	5 1/2%
Time	1/4	Time	1/4
Interest	$1.72	Interest	$1.74
Balance	$126.72	Balance	$128.46

Third Quarter		Fourth Quarter	
New Principal	$128.46	New Principal	$130.23
Rate	5 1/2%	Rate	5 1/2%
Time	1/4	Time	1/4
Interest	$1.77	Interest	$1.79
Balance	$130.23	Balance	$132.02

Interest earned after 12 months = $132.02 - $125.00 = $7.02

ACTIVITY 4 - OUTCOME 3

Obtain copies of interest tables from financial institutions. As soon as students understand how simple and compound interest are computed, interest tables can be utilized. Extend student practice to include examples that are more complex. Problems similar to the ones below would be appropriate.

Example 1: What is the difference in the interest when $600 is compounded at 8% for three years quarterly instead of annually?

Example 2: How much less interest does $4000 bring invested at 5% simple interest for four years than when invested at 5% compounded annually?

AREA: CONSUMER CREDIT

OUTCOMES:
1. Compute interest.
2. Identify advantages and disadvantages of using credit.
3. Compute the cost of credit for interest-bearing charge accounts, and identify any fixed costs associated with the credit plans studied.
4. Compare cash versus credit purchases.
5. Identify or list consumer responsibilities associated with credit, i.e., liability for consumer-purchased items, stolen card responsibility, etc.

NOTES FOR THE TEACHER

Prerequisite for Students

1. Add, subtract, multiply, and divide whole numbers, decimal numbers, fractions, and percents.

Steps to Success

1. Guide a discussion on consumer credit. Discussion should include the following questions.

    1. What are the advantages of credit?

        Credit allows purchase to be made need without having the cash on hand (cars, houses, and furniture).

    2. What are the disadvantages?

        Credit buying usually increases the cost.

    3. How is credit obtained?

        Have students examine applications for charge cards and installment contracts.

NOTES FOR THE TEACHERS (Cont'd)

4. What is an advantage of a "good" credit rating?

   It allows the buyer to obtain credit when needed.

5. What are the costs of credit?

   Define or describe carrying charges, down payment, interest, finance charges, etc.

6. What is the consumer's responsibility if credit cards are stolen or payments are not made?

   The company issuing the card must be notified immediately when the card is lost or stolen. When payments are not made, the consumer is required to return the card to the company. The consumer is still responsible for the charges.

ACTIVITY 1 - OUTCOMES 2, 3, and 5

Begin with research activities which indicate that there are several different methods of determining a finance charge. Have students research companies that issue credit cards. Assign a variety of companies so that students can report on: the previous-balance method of computing finance charges; the unpaid-balance method of computing finance charges; and the average-daily-balance method of computing finance charges.

Monthly finance charge rates are generally tied to a state's usury law. Have students find the manner in which a monthly finance charge is linked to Alabama law.

Have students report their findings. Discussion should center upon the following topics:

1. Advantages and disadvantages of using credit
2. Identification of any fixed costs associated with credit plans
3. Consumer responsibilities associated with credit
4. The method of computing finance charge most widely used
5. The incentives offered by companies to encourage credit card holders to use their cards
6. Different periodic rates charged by credit card companies

ACTIVITY 2 - OUTCOMES 1, 3, and 4

Provide a variety of problems dealing with consumer credit. Students should solve problems similar to the following:

Example 1: A new stove can be purchased for $465 cash or 20% a month for 18 months. How much can be saved by paying cash? How much are the carrying charges?

Example 2: If the monthly finance charge is 2%, what is the annual percentage rate? If the monthly charge is 1 3/4%, what is the annual percentage rate?

Example 3: A certain department store charges 1 1/2% per month interest on the unpaid balance of the account. Jim charges $218.46 for new clothes for school in September. On October 1 he paid $100.00 on the account. On October 10 he charged a gift for $16.50. What is the new balance owed on his account at the end of October?

AREA: HOUSING

OUTCOMES:
1. List advantages and disadvantages of renting versus buying.
2. Compute costs of mortgages at different rates for different time frames.
3. Investigate and compute maintenance and upkeep costs of houses, mobile homes, and condominiums.
4. Investigate and compute utility costs.
5. Examine simple lease contracts.
6. Compute anuual rent costs.

NOTES FOR THE TEACHER

Prerequisite for Students

1. Add, subtract, multiply, and divide whole and decimal numbers.

Step to Success

1. The activities that follow depend heavily upon outside speakers. The success of each activity will depend upon careful selection of the speaker and preparation of the students for the speaker.

ACTIVITY 1 - OUTCOMES 1, 5, and 6

Explain to students that housing is the most expensive item in most people's budget. Begin a study of housing costs by inviting a real estate agent from the community to talk with the class about the advantages and disadvantages of renting versus buying a home. Instruct the real estate agent to discuss rental property first. Prior to the visit have students compile a set of topics that the representative should address. Topics could include some of the following:

1. Range of rental rates found in the community
2. Examples of typical lease agreements
3. Expenses in addition to the amount of rent involved in apartment costs (utilities, insurance)
4. Recommended percentage of total income that should be spent on housing
5. Special features to consider when selecting an apartment to rent

ACTIVITY 1 - OUTCOMES 1, 5, and 6 (Cont'd)

Provide students and speaker with the list of topics to be addressed. After the visit, provide examples similar to the following for student practice.

Example 1: What is your rent for a year if your monthly rent is (a) $150? (b) $275? (c) $450?

Example 2: If a person should not pay more than 25% of his income for rent, what is the highest monthly rent he should pay if his income is (a) $19,500 per year? (b) $1,200 per month? (c) $240 per week?

ACTIVITY 2 - OUTCOMES 1 and 2

Invite the same real estate agent to describe procedures for purchasing a home. Prior to the visit, introduce students to terms such as mortgage loan, principal, interest, down payment, closing costs, and monthly payments. Again, have students compile a list of topics that should be addressed by the real estate agent. Topics could include some of the following:

1. Types of mortgages that are available
2. Examples of payment books
3. Current mortgage rates in the area and required down payments
4. Examples of forms used to specify closing costs and explanations of terms such as credit report, title, abstract, deeds, escrow account, legal fees
5. Real estate taxes
6. Advantages and disadvantages of paying cash versus paying a small down payment and making monthly payments
7. Examples of monthly payment tables that indicate annual interest and various lengths of loans

Be sure that the real estate agent provides the class with monthly payment tables to be utilized in solving problems. Following the visit of the real estate agent, provide students with problems involving the amount of the original loan, the total amount of interest charged, and the total amount paid. Work a few examples together until students understand that the total amount paid which includes interest is much greater than the original loan. Use examples similar to the following:

ACTIVITY 2 - OUTCOMES 1 and 2 (Cont'd)

Example: Mr. and Mrs. Jones applied for a $40,000 mortgage loan at an annual rate of 11%. The loan is for a period of 30 years and will be paid in equal monthly payments that include interest. Find the total amount and the total interest that will be paid.

Solution: 1. Find the monthly payment from the monthly payment tables.

$40,000 at 11% for 30 years = $380

2. Find the number of payments.

12 months x 30 years = 360

3. Find the total amount to be paid.

$380 x 360 months = $136,800

4. Find the total interest charged.

$136,800 - $40,000 = $96,800

With the aid of monthly payment tables and calculators, students can acquire proficiency by practicing the solving of problems similar to the following:

Example: What would be the (a) monthly payment, (b) total interest charged, and (c) total amount paid on a house costing $52,000 on which a 15% down payment is made if the following apply:

25 year mortgage at 9 1/2%
25 year mortgage at 11%
30 year mortgage at 9 1/2%
30 year mortgage at 9%

ACTIVITY 3 - OUTCOMES 3 and 4

Invite one or more speakers to talk with the class about housing costs. A qualified speaker may be a financial counselor, a parent, or an insurance agent. Explain to the speaker that the class is investigating the costs of maintaining rental property, mobile homes, houses, and condominiums. Ask the speaker to address topics such as the following:

1. Fixed charges (mortgage payment, rent, insurance, taxes)
2. Regular variable charges (electricity, gas, water)
3. Other variable charges (plumbing, roofing, the purchase of a lawn mower)

Tell the speaker to emphasize the ways in which consumer usage affects regular variable charges, such as electricity.

Following the visits and other initial instruction, have each student report on all housing costs incurred in his or her household during one month. Teachers may need to explain the project to parents and guarantee confidentiality, if necessary. Provide students with a table similar to the one that follows. Explain that not all items will apply to all households. Instruct students to be as thorough as possible in completing the table.

ACTIVITY 3 - OUTCOMES 3 and 4 (Cont'd)

TYPE OF HOUSEHOLD _____

FIXED CHARGES		REGULAR VARIABLE CHARGES		OTHER VARIABLE CHARGES	
Mortgage Payment		Electricity		Painting	
Insurance		Gas			
Real Estate Taxes		Water and Sewer		Purchases (Specify)	
Rent		Telephone			
Maintenance Fee				New Door	
				New Mailbox	
Other (Specify)		Other (specify)			
Cable T.V.				Other (Specify)	
Furniture Payment					
				Repair Stove	
					GRAND TOTAL
SUBTOTAL		SUBTOTAL		SUBTOTAL	

Instruct students to be prepared to explain any item in the table. For example, insurance costs may be a part of the mortgage payment.

After careful review, the teacher may wish to share selected tables with the class. Tables showing a variety of items and costs could be of interest. The teacher might erase the "Type of Household" from the table to see if students can determine from the items which type of household is being described.

AREA: INSURANCE

OUTCOMES:
1. **Explain the purpose of health, life, and home insurance.**
2. **Compute costs of different types of insurance.**
3. **Compute costs of different kinds of life insurance.**
4. **Compute costs of home insurance.**

NOTES FOR THE TEACHER

Prerequisites for Students

1. Add, subtract, multiply, and divide whole and decimal numbers.
2. Convert percents to decimals.

Steps to Success

1. The activities that follow depend heavily upon outside speakers and the collection of needed resource material. The success of the activities depends upon careful planning.

2. The success of speakers (ACTIVITY 3) depends upon a clear explanation of what is expected from the speaker. Consider giving speakers written information about the content that should be presented to students.

ACTIVITY 1 - OUTCOMES 1 and 2

Obtain copies of hospital bills. Distribute copies of these bills to students and discuss the extreme costs of items such as hospital rooms, surgery, and visits to the doctor. Ask students to relate any medical expenses that have occurred in their families during the past year. Explain that health insurance is designed to protect people against overwhelming medical expenses.

ACTIVITY 1 - OUTCOMES 1 and 2 (Cont'd)

Teachers can use copies of their own health insurance policies to illustrate the meaning of terms such as hospital insurance, surgical-medical insurance, basic plan, comprehensive plan, deductible clause, coinsurance clause, premium, coverage, group plan, and non-group plan.

Following initial instruction, divide students into small groups. Have each group investigate the type of insurance available to employees of a local business. Each group should submit its research plan in writing to the teacher. Plans must include:

1. Business to be contacted
2. Contact person at the business
3. Date of visit to the business
4. Types of information to be obtained from the visit

Each group should report on its visit to the class.

Reports should include the following:

1. Type of health insurance offered employees
2. Type of coverage included in the policy
3. Total annual premium per employee
4. Contributions of employer and employee toward the premium

Some students may wish to conduct the same type of study of the cost of non-group health insurance.

After students have made a study of health insurance, problems similar to the following would be appropriate for practice.

Example: Joe pays $22.50 a month for individual health coverage. This coverage pays 80% of all Joe's hospital bills and hospital-related expenses. Joe paid insurance without using it for four years. He had an accident and was in the hospital for eight days. His total bill was $9,860. How much of the total bill did Joe have to pay? How much did the insurance pay? How did the amount the insurance paid compare with the amount Joe had paid for insurance coverage?

ACTIVITY 2 - OUTCOMES 1 and 3

Collect insurance company advertisements, brochures, and schedules of payments. Distribute sufficient copies of those materials to students.

List terms related to life insurance on the chalkboard. Include terms such as the following:

Term life insurance	Annual premium	Cash value
Whole life insurance	Monthly premium	Loan value
Limited-payment life insurance	Quarterly premium	Policy
Endowment life insurance	Semi-annual premium	Beneficiary
		Face value

Ask students to use the materials distributed to find the meaning of the terms listed on the chalkboard. Students may work alone, in pairs, or in small groups. Following a study of the written material, students should discuss the meanings of the terms. Teachers should provide needed explanation and instruction, if necessary.

Decide upon one schedule of life insurance payments for students to consult in solving problems. Then for practice, provide examples similar to the following:

Example: Find the annual premium for a twenty-two year old male for a $15,000 ordinary life policy issued at $1.25 per month per thousand.

Consumer Mathematics texts or workbooks will contain portions of payment schedules and problems for additional student practice.

ACTIVITY 3 - OUTCOMES 1 and 4

Include in the study of home insurance instruction in comparison shopping. Invite representatives from two insurance companies to speak to the class on homeowners policies. Ask each representative to explain how home insurance costs are computed. Ask each representative to discuss various items to be covered, such as dwelling, personal property, loss of use, personal liability, and medical payment. Ask each representative to discuss factors that affect the rates: a frame versus a brick structure, distance from a water source, and distance from a fire station. Ask each representative to illustrate with examples and use of tables how the annual premium would be calculated.

ACTIVITY 3 - OUTCOMES 1 and 4 (Cont'd)

Before each representative leaves, ask that the yearly premium for a specific situation be calculated. (The specific circumstance should be agreed upon by the class in advance.) After each representative quotes an annual premium, ask if there are other reasons/benefits for selecting that particular company for home insurance. When both representatives have completed their visits, compare the annual premiums and additional benefits discussed.

Ask insurance representatives to leave information on insurance costs with the class. Explain that sufficient information is needed to solve problems similar to the following:

Example: In a certain town, the rate for a one-year policy on a frame building is $.24 per $100 and on a brick building is $.14 per $100. At these rates what is the yearly premium on a $80,000 frame building? A brick building of the same value?

From information distributed, have students write problems to be exchanged with their classmates.

AREA: PROBABILITY AND STATISTICS

OUTCOMES:
1. **Apply probability of events to relative experiences.**
2. **Compute the relative frequency or probability of an event.**
3. **Compute the probability of independent and dependent events.**

NOTES FOR THE TEACHER

Prerequisite for Students

1. Work with ratios.

Steps to Success

1. Make sure students understand that the outcomes of an experiment are all the possibilities that can happen when an experiment is performed.

The possible outcomes of spinning this dial are 1, 2, 3, or 4.

2. Emphasize that relative frequency is the ratio of possible desired outcomes to the total number of outcomes. The relative frequency of spinning a "3" is one out of four or 1/4.

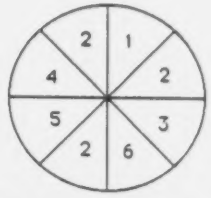
ACTIVITY 1 - OUTCOME 1

Look at the weather reports for the previous week or month. Have the students list all the different predictions made: cloudy, sunny, rainy, partly cloudy; the number of times each prediction was made; and the total number of days for which predictions were made. Use this information to guide a discussion of the accuracy of the weather predictions for the past week or month and to make a prediction on the accuracy of the weather forecast for the coming week and month.

ACTIVITY 2 - OUTCOME 2

Use of a dial is helpful in demonstrating relative frequency or probability of an event. Design a dial and questions similar to those that follow.

Draw a dial on the chalkboard. Ask questions such as "What is the relative frequency of a "6" occurring on the dial?" (1/8)



One (1) is the number of times the 6 occurs.
Eight (8) is the total number of possible outcomes.

Give students several examples. Make sure they understand that the relative frequency of a "2" occurring is 3/8 since "2" occurs three times on the dial, and the total number of possible outcomes is 8.

Explain that the probability of spinning a "2" on the dial is the relative frequency, 3/8 and can be expressed as a ratio or as a percent, 37 1/2%.

Use the dial to answer questions similar to the following:

1. What is the probability of spinning a "3"?
2. What is the probability of spinning a "3" or a "2"?
2. Express these as ratios and percents.

ACTIVITY 3 - OUTCOME 2

The students in a classroom can be divided into categories. The membership of students in a given category makes it possible to ask relative frequency questions. Teachers can use the following example with their classes. Similar examples can be designed which refer to the actual students in their classes.

ACTIVITY 3 - OUTCOME 2 (Cont'd)

Example: In a class of 20 students 9 are boys, 11 are girls, 2 are baseball players, 4 are taking French, and 6 are taking chemistry.

Determine the relative frequency of

a. boys
b. girls
c. baseball players
d. students taking French
e. students taking chemistry
f. horses in the room

Solution: a. 9/20 boys
b. 11/20 girls
c. 3/20 baseball players
d. 4/20 = 1/5 French students
e. 6/20 = 3/10 chemistry students
f. 0/20 = 0 horses

Use a and b in the example above to show that the sum of the relative frequencies of all possible outcomes is always equal to one.

boys + girls = total in class
relative frequency of boys + relative frequency of girls = 1
9/20 + 11/20 = 1

Use f in the example above to show that a non-occurring event has a relative frequency of zero.

ACTIVITY 4 - OUTCOME 3

Twelve tennis balls numbered one through twelve are needed for this activity.

Have a student pull one ball out of a paper bag. Instruct the student to note the number on the ball and hold it so that the other students cannot see it.

ACTIVITY 4 - OUTCOME 3 (Cont'd)

In this setting, ask questions similar to the following:

a. What was the probability of pulling out the ball with that number?
b. What is the probability of selecting a ball with an even number? An odd number?
c. If the selected ball is left out of the sack, how is the probability of choosing one of the remaining numbers affected?
d. What happens as the number of balls in the sack is progressively reduced?
e. How is the probability affected if the balls are replaced each time they are selected?

AREA: PROBABILITY AND STATISTICS

OUTCOMES:
4. Describe and use various methods of collecting data.
5. Define and compute the four basic measures of central tendency: mean, mode, median, and range.
6. Compare and contrast the ways in which mean, mode, and median can be used to alter the presentation of data.

NOTES FOR THE TEACHER

Prerequisites for Students

1. Be able to add, subtract, multiply, and divide.
2. Understand descending and ascending order.

Step to Success

1. Students must understand the meaning of the following terms:

   a. Data - The information to be analyzed. (It may be a set of test scores, ages, hair color, heights, etc.)
   b. Range - The difference between the smallest and the largest numbers in the set of data.
   c. Mean - An average. (It may be found by adding the data and dividing by the number of data.)
   d. Median - The middle number in a set of data when the data is arranged in asending or descending order is the median. In cases where the number of data is even, average the two middle numbers to obtain the median.
   e. Mode - The number (or numbers) which occurs most often in a set of data. (A set of data may have no mode - no number occurs more often, one mode - a single number occurs more often or several modes - more than one number occurs the same number of times).

ACTIVITY 1 - OUTCOME 5

Determine the range, mean, median, and mode of data by using the definitions of each term given in the Steps to Success and the information given in each example. To first order all information (data) in either ascending or descending order is an additional step that is often helpful.

Example 1: Data: 8, 15, 12, 15, 5

Find the range, mean, median, and mode.

Solution: Arrange the data in ascending or descending order.

Ascending order: 5, 8, 12, 15, 15

Range:

largest number	15
- smallest number	- 5
range	10

Mean:

5 + 8 + 12 + 15 + 15 = 55
55 divided by 5 = 11
11 is the mean.

Median: Since the data contains an odd number of items, the middle number (12) is the median.

Mode: The number 15 occurs twice. Since no other number occurs two or more times, the mode is 15.

Example 2: Data: 20, 30, 40, 50

Find the range, mean, median, and mode.

Solution: The data is already listed in ascending order.

Range:

largest number	50
- smallest number	- 20
range	30

Mean:

20 + 30 + 40 + 50 = 140
140 divided by 4 = 35
mean = 35

Median: 20, 30, 40, 50

Since the data contains an even number of items, two numbers (30, 40) are "in the middle."

To find the median, find the mean of the two middle numbers.

Add 30 + 40 = 70
Divide 70 by 2 = 35
The median is 35.

Mode: This set of data has no mode since no number occurs more often than another number.

Remind the students not to list the mode of this data as 0. 0 is a number. They should say there is no mode.

ACTIVITY 2 - OUTCOMES 4, 5, and 6

Ask students to count the number of coins in their pockets or purses. Record the various numbers of coins on the board using a table such as the following:

No coins // 2	3 coins ~~////~~ 5	Over 5 coins ~~////~~ // 7
1 coin / 1	4 coins /// 3	
2 coins /// 3	5 coins //// 4	

Ask students to:

A. find the range $7 - 1 = 6$

B. find the mean $\frac{2 + 1 + 3 + 5 + 3 + 4 + 7}{7} = \frac{25}{7} = 3.57$

C. find the mode over 5 coins

D. find the median 4 coins

Have the students to write their predictions for each number of coins the class will have for the next day. Determine the range, mean, mode, and median each day. Which measures vary the most? Continue this activity for several days. Let the students determine if their predictions are becoming more accurate.

ACTIVITY 3 - OUTCOMES 4, 5, and 6

Poll the class. Ask the students to tell the number of brothers and sisters they have. Compile the data. Have the students compute the range, mean, median, and mode for the number of brothers, the number of sisters, and the number of brothers and sisters.

Ask the class which of these statistical items is or is not representative of the data. (Are any of the items in the set of data extremely high or extremely low?) Sometimes items that are extremely high or low influence the outcome of the statistics.

ACTIVITY 3 - OUTCOMES 4, 5, and 6 (Cont'd)

How do these extremely high or low items influence the range, mean, median, and mode? Which measures are influenced the most? Which measures are influenced the least?

Have students make predictions about other classes based on the information they have found to exist for their class. Poll the other classes. Compute the range, mean, median, and mode for their information, and determine if the students' predictions were accurate.

AREA: MONEY MANAGEMENT

OUTCOMES:
1. **Compute and compare hourly, weekly, monthly, and annual salaries.**
2. **Identify various types of salary deductions: social security; federal, state, and local income taxes; union/professional dues; insurance, etc.**
3. **Compute net play.**

NOTES FOR THE TEACHER

Prerequisites for Students

1. Add, subtract, multiply, and divide decimals.
2. Convert percents to decimals.

Steps to Success

1. Point out that a "wage earner" earns pay for hours worked. These hours are usually recorded by a time clock or a foreman. A "salaried" employee earns a set amount, regardless of the number of hours worked. The salary may be weekly, monthly, or annually, once agreed upon. The annual salary is not paid annually but is divided by 12 if the pay period is monthly, by 24 if it is bi-monthly, by 26 if it is bi-weekly, and by 52 if it is weekly. The salary is paid throughout the year at that rate.

2. Define gross pay, total salary or total wages, and net pay.

3. Identify the following types of deductions:

   Federal income tax
   State income tax
   Local income tax
   Social security (FICA) Federal Income Contributions Act
   Insurance (where companies provide this)
   Union and professional dues

ACTIVITY 1 - OUTCOMES 1 and 2

This activity introduces students to the fact that some occupations pay employees by salary, and others are based on the collection of fees or hourly wages. The activity also shows that most earnings are subject to certain required deductions.

Have students compile a list similar to the one below. The teacher can use the chalkboard while students write at their desks.

LISTS OF OCCUPATIONS		
SALARY	FEE COLLECTION	HOURLY WAGES
Teacher	Lawyer	Carpenter
Pilot	Consultant	Assembly Line Worker
Government Employee	Doctor	Auto Mechanic

Instruct students to interview persons employed in one of the occupations listed. Students should then prepare a report that includes items similar to the following:

1. Occupation

2. Method of earning and receiving wages

   Examples: Weekly salary
   Monthly salary
   Bi-weekly salary
   Established fee
   Agreed-upon fee
   Hourly wages
   Overtime

3. Is the method of earnings appropriate for the kind of work performed? If not, what is the appropriate method of earnings for the occupation?

ACTIVITY 1 - OUTCOMES 1 and 2 (Cont'd)

4. What is the established standard for the earnings?

   Examples: Union wages
   Minimum wages
   Established salary scale
   Established fees
   Contractual agreement

5. Would the person interviewed prefer to received his/her salary by some other method? If so, which method and why?

6. What are some of the items that are deducted from their earnings?

   Examples: Federal income tax
   State income tax
   Social payment
   Pension payment
   Insurance
   Union dues
   Savings
   Professional dues
   Investments

Have students share their reports in class.

ACTIVITY 2 - OUTCOMES 1, 2, and 3

After students have an understanding of how wages are earned and how deductions are made from gross pay, teachers should provide problems similar to the following:

Example 1: Which would be a better salary? $5.40 per hour for 40 hours a week or $225 per week? Compare these salaries to $900 per month. Which is better? Why?

Example 2: Which is a better wage: $360 per week or 18,000 per year? Suppose the annual salary includes a three-week paid vacation, but the weekly salary does not. Which is better?

ACTIVITY 2 - OUTCOMES 1, 2, and 3 (Cont'd)

Example 3: Jay makes an annual salary of $22,500. He is paid monthly. What is his monthly gross pay? He has the following deductions from each month's check:

Federal income tax	9.1%
State income tax	2.5%
Insurance	$64.00
Professional organization dues	$22.00
Social security	7.15%

Compute his net pay.

AREA: MONEY MANAGEMENT

OUTCOMES:
4. Identify areas that should be included in budgets: housing, utilities, food, clothing, transportation, insurance, savings, and recreation.
5. Develop a budget.

NOTES FOR THE TEACHER

Prerequisites for Students

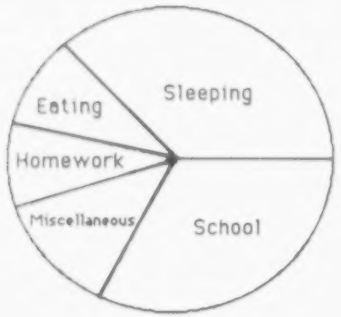
1. Add, subtract, multiply, and divide with decimals and percents.
2. Understand and use rounding.

Steps to Success

1. Introduce budgets by asking the students if they live within a budget. Since some students may not live within a budget, indicate that time as well as money can be budgeted.

   Have the students make a circle graph showing how their time is budgeted in one twenty-four hour period.

   Example:



NOTES FOR THE TEACHER (Cont'd)

2. ACTIVITY 1 requires that students develop an elementary budget. The budget may represent the income and expenditures of the student or of a person interviewed.

3. Students should apply their knowledge of budgets to solve problems related to budget allocations (ACTIVITY 2).

ACTIVITY 1 - OUTCOMES 4 and 5

Have students list some things (both general and specific) that might be included in a family's budget. Some of the items to be included are:

Food	Housing	Clothing	Transportation	Personal	Savings
groceries	rent/mortgage		car payment	medical insurance	deposit to savings
eating out	insurance		maintenance/ repair	recreation costs	
school lunches	utilities (phone, power, gas, water, cable)		auto insurance		
			gas/oil		

Identify which of the above costs are "fixed" and which fluctuate.

Have students prepare an elementary weekly and/or monthly budget. Some students may base the budget on their own earnings and expenditures. Other students will need to interview a person who earns a salary from specific work.

Give students a basic outline for the budget. Discuss sources of income as well as expenditures. Instruct students to include items similar to the following:

1. Name of job, career, occupation (if applicable)

2. Sources of income: salary; hour, weekly, or monthly wages; overtime; commission; interest earned

3. Expenditures: housing, food, transportation, clothing, education, recreation, credit payment, charitable contributions

Budgets can be discussed and shared.

ACTIVITY 2 - OUTCOME 4

Explain to students that researchers have determined that the "average" family of four spends certain percentages of their income in specified areas. Use tables similar to the following to demonstrate the findings of researchers.

	Researcher 1	Researcher 2
Food	30%	26%
Housing	32%	31%
Clothing	10%	9%
Transportation	17%	17%
Savings/Personal	11%	17%

Use tables similar to the one above to generate problems similar to the following for students to solve.

Example: The Joneses have a net income of $1,465.00 per month. How much do they spend on each category listed above according to researcher 1? According to researcher 2?

AREA: MONEY MANAGEMENT

OUTCOMES: 6. Compute and compare unit costs.
7. Read and analyze various warranties and guarantees.

NOTES FOR THE TEACHER

1. ACTIVITY 1 is a research activity that requires students to compare unit costs and analyze warranties. The success of the activity depends upon careful identification of items that are priced in packages, thereby having a unit price. The success of the activity depends also upon the identification of items that carry warranties or guarantees.

2. The activity does not include specific instruction in determining unit costs. Teachers may need to provide that instruction to some students.

ACTIVITY 1 - OUTCOMES 6 and 7

Ask students to help prepare a list of items that are needed in their classrooms. Indicate that items should be one of two types:

1. Relatively expensive items that would be likely to have guarantees and/or warranties

2. Items that can be sold in packages, thereby requiring the calculation of a unit cost to determine the "best buy"

ACTIVITY 1 - OUTCOMES 6 and 7

Teachers may need to give a few examples until students understand the types of items to be listed. Appropriate items should be listed on the chalkboard. Lists could include some of the following:

Items with Warranties	Items Sold in Packages
audio tape recorder	audiotapes
videotape recorder	videotapes
video monitor	diskettes
micro-computer	pencils
	notebook paper
	magic markers

Divide students into small "market research" groups. Explain that the group will determine which item from the chalkboard it will investigate. The assignment for each group is to determine the "best buy" on the selected item.

Before students can determine the "best buy" on any item, they will need to describe in precise terms the type of item to be investigated. Each group should write the specifications for the item to be studied. For example, if prices of a video monitor are to be studied, how large should the monitor be? Should the monitor be black and white or color? Are stereo features desired?

Teachers should monitor the specifications developed by each group until the specifications are appropriate for the item and in line with the skills and sophistication of the given group.

Give students a basic outline for reporting the findings of their studies. The outline should include items similar to the following:

1. Item investigated

2. Specifications for item (determined and approved prior to the investigation)

3. Business visited to obtain prices

ACTIVITY 1 - OUTCOMES 6 and 7 (Cont'd)

4. Purchase prices
   For each item compared, report the following:

   a. Place where item is sold

   b. Brand name

   c. Price (Include packaging information and unit price, if applicable.)

   b. Description of match between the item and the specifications

   e. Description of special features that were not in the specifications

   f. Warranty and guarantee information (if applicable)

5. Conclusion regarding the best buy

Groups should have careful supervision prior to and during their studies. The teacher should advise students about the number of items to be compared. If an item is relatively expensive with several features in the specifications, then it may be appropriate to compare only two or three items. Numerous estimates, however, might be appropriate for relatively inexpensive items (pencils and paper, for example).

AREA: SAVINGS AND INVESTMENTS

OUTCOMES: 1. **Compute simple and compound interest on savings accounts.**
2. **Compare interest earned on savings bonds, certificates of deposit, and money markets.**

NOTES FOR THE TEACHER

Prerequisites for Students

1. Add, subtract, multiply, and divide whole numbers, fractions, and decimals.

2. Have an introductory knowledge of established ways to save money: savings accounts, bonds, certificates of deposit, and money markets.

Steps to Success

1. Invite a speaker to talk to the class about the value of saving regularly. Be sure to invite someone who can explain terms such as the following:

Certificate of deposit	Penalties for withdrawals
Annual yield	Savings bonds
Interest rate	Face value
Money market certificate	Redemption value
Money market rates	
Penalties for withdrawals	

2. Be sure that students understand principal, annual interest rate and simple interest. Simple interest is used extensively in savings and investment situations. (ACTIVITY 1 and 2)

3. Explain that compound interest includes interest earned on the original principal and on the interest earned during the previous interest periods. Point out that the amount of interest that the same principal can earn depends on how frequently the interest is paid. (ACTIVITY 1 and 3)

NOTES FOR THE TEACHER (Cont'd)

4. Design projects that will result in students comparing the interest earned on savings bonds, certificates of deposit, and money markets. (ACTIVITY 4 and 5)

ACTIVITY 1 - OUTCOME 1

Explain that interest is the amount of money a person earns for allowing the bank to use his or her money. Introduce the formula for computing simple interest:

Interest = Principal x Rate x Time

Make sure that students understand each term in the formula, and that they can solve problems similar to the following:

Compute simple interest on the following problems:

1. $300 at 7% for 1 year
2. $1,500 at 10 1/2% for 5 years
3. $450 at 12% for 8 months
4. $5,200 at 9.75% for 5 months
5. $2,300 at 6 1/2% for 2 years and 9 months

ACTIVITY 2 - OUTCOME 1

Explain that compound interest is interest earned on the original principal and on the interest earned during the previous interest periods. Point out that the calculation of compound interest requires that the balance of an account (or amount) be determined at the end of each interest period. Introduce the formula below and apply it to the calculation of compound interest.

Amount = Principal + Interest

ACTIVITY 2 - OUTCOME 1 (Cont'd)

Work an example with the class to demonstrate that the amount from the previous interest period becomes the principal for the next interest period.

Example: Sally Smith's savings account earns 5.5% interest compounded quarterly. Sally deposits $100 into this savings account. What is the amount in the savings account at the end of the first quarter? At the end of the second quarter?

Solution:

1. Find the principal. $100.00

2. Find the interest for the first quarter.

   I = PRT
   I = $100 x 5.5% x 1/4
   I = $ 1.38

3. Find the amount for the first quarter.

   A = P + I
   A = $100. + $1.38
   A = $101.38

4. Find the new principal for the second quarter. $101.38

5. Find the interest for the second quarter.

   I = PRT
   I = $101.38 x 5.5% x 1/4
   I = $ 1.39

6. Find the amount for the second quarter.

   A = P + I
   A = $101.38 + $1.39
   A = $102.77

ACTIVITY 2 - OUTCOME 1 (Cont'd)

Have students complete a table similar to the following:

Principal			
Annual Interest Rate			
Interest Period	semiannually	quarterly	monthly
First Period Interest			
Amount			
Second Period Interest			
Amount			

If calculators or interest tables are available, have students compute compound interest on problems similar to the following:

1. $900 for 15 years at 5% compounded annually
2. $2,800 for 4 years at 9% compounded semi-annually
3. $3,000 for 3 years at 6% compounded quarterly
4. $11,000 for 2 years at 5 1/2% compounded semi-annually
5. $950 for 4 1/2 years at 8 3/4% compounded monthly
6. What is the difference in interest when $800 is compounded quarterly at 7% for 3 years instead of semi-annually?

ACTIVITY 3 - OUTCOME 1

Explain to students that they are to investigate the highest possible yield they can obtain when depositing $50.00 in a savings account. Instruct students to visit the savings departments of local banks and savings and loan associations. Students are to tell the cashier that they are involved in a school project to compare interest rates on savings accounts. For each visit, students are to submit a report that includes the following:

1. What is the name of the financial institution?

2. What is the interest rate on the savings account?

3. Is the interest rate simple or compound?

4. If the interest rate is compound, how often is the interest compounded?

5. If $50.00 is placed in the savings account at that institution, how much interest will be earned in

   a. one year?
   b. two years?
   c. five years?

Class discussion should center around why the yield is greater on compound interest than on simple interest.

ACTIVITY 4 - OUTCOME 2

Invite a savings and loan or bank representative to talk to the class about the value of saving regularly through investments such as U. S. Savings Bonds.

Tell students to assume that they have purchased a $50.00 U. S. Savings Bond. Explain that the bond was purchased at 50% of its face value at the time of the purchase. The bond accrues interest at 7.5% compounded annually from the initial date of purchase. At the end of a ten year period, the face value and the cash value of the certificate are approximately the same.

ACTIVITY 4 - OUTCOME 2 (Cont'd)

Provide each student with a copy of the following table. Explain that the table reflects how the cash value of the bond grows over a specific period of time until after 10 years maturity is reached.

Year Held	Purchase Value	Interest Rate	Interest Earned	Cash Value
1	25.00	.075	1.87	26.88
2	26.88	.075	2.02	28.90
3	28.90	.075	2.17	31.07
4	31.07	.075	2.33	33.40
5	33.40	.075	2.51	35.91
6	35.91	.075	2.69	38.60
7	38.60	.075	2.90	41.50
8	41.50	.075	3.11	44.61
9	44.61	.075	3.35	47.96
10	47.96	.075	3.60	51.56

Ask students to use the table to solve problems similar to the following:

1. Determine the cash value of the bond if it is held for:

   a. One year
   b. Three years
   c. Ten years

2. What is the cash value of the bond when purchased as compared to the cash value of the bond at maturity.

3. By saving regularly at a compound interest rate of 7.5%, would it be possible to accumulate $1,000,000 in a lifetime? How much would need to be invested at what time in a person's life?

ACTIVITY 5 - OUTCOME 2

Introduce the topic "investment planning" by writing to a representative from a savings and loan association or an investment department of a bank or credit union, an investment broker, or a financial advisor. Request that the representative talk with the class about the value of planning how to invest money. Following the introductory

talk, provide students with a copy of the weekly budget that follows. Explain that the budget has been prepared for Jim and Wanda Carr, who have a total weekly income of $450.00 before deductions.

Jim and Wanda Carr's
Weekly Budget

A.	Total Weekly Income (before deductions)		$450.00
	Deductions:		
	1. Income Tax	$ 75.00	
	2. FICA	15.00	
	3. Insurance	25.00	
	4. Pension Plan	15.00	
	Total Deductions	$130.00	
	Net Weekly Income		$320.00
B.	Weekly Expenses		$215.00
	1. Rent	$ 75.00	
	2. Food	30.00	
	3. Clothing	15.00	
	4. Utilities	25.00	
	5. Car payment	30.00	
	6. Entertainment	20.00	
	7. Miscellaneous	20.00	
	Total Expenses	$215.00	
	Net Income		$320.00
	Expenses		- 215.00
	Cash Left over		$105.00

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ACTIVITY 5 - OUTCOME 2 (Cont'd)

Tell students that they are to use the information in the budget to establish an investment plan for Jim and Wanda Carr. Instruct students that they are to decide how much of the weekly, left-over cash ($105.00) they plan to invest. Advise students to contact one of the following in order to obtain information for their report:

1. Saving and loan association
2. Investment department of a bank
3. Credit union
4. Investment broker

Their report should include the following:

1. Amount of left-over cash to be invested
2. Explanation of how the money is to be invested (savings account, savings bond, money market, certificate of deposit)
3. The interest rate
4. The expected yield at the end of one year, three years, five years, ten years, and twenty years

AREA: SAVINGS AND INVESTMENTS

OUTCOME: 3. Have an awareness of various types of investments such as stocks, bonds, land, antiques, art, jewels, etc.

NOTES FOR THE TEACHER

Step to Success

1. Make the students aware of the different types of investments (for income or profit) that can be made. Point out that many people buy homes, land, antiques, art, or jewels as investments. If the need should arise, the sale of this property would possibly result in a return or profit on their money.

ACTIVITY 1 - OUTCOME 3

Have the class "invest" in the stock market over a period of several weeks. Watch the rise or fall of the price of the stocks, figuring profit or loss. Mention that when dealing with a stock broker or investment company, a commission or broker's fee must be paid. This must be taken into account and subtracted from any profit.

ACTIVITY 2 - OUTCOME 3

Following sufficient classroom discussion and instruction, have students solve problems similar to the following:

1. Albert bought a $10,000 bond paying 8% interest for $8,500. What is his current (annual) yield on the bond?
2. Jan bought a painting for $600. Four years later she sold it for $850. What was the annual rate of return on her investment?
3. Larry bought farm property for $8,000. Fifteen years later the city had expanded to encompass the property. Larry's property was rezoned as commercial property. Property taxes zoomed, and a businessman offered Larry $42,000 for his land. What was his annual rate of return? If he had paid cash originally, how much cash profit did he make?

AREA: TAXES

OUTCOMES:
1. **Read tax tables.**
2. **Complete income tax forms.**
3. **Compute property taxes.**
4. **Identify and compute various taxes.**

NOTES FOR THE TEACHER

Prerequisite for Students

1. Add, subtract, multiply, and divide whole numbers, fractions, and decimals.

Steps to Success

1. Make sure students understand the meaning of a mill. One mill is equal to 1/1000 of a dollar. This may be more easily understood by writing it as $.001.

2. Impress upon students that property taxes are most often based on assessment value, which is usually a percentage of actual value.

ACTIVITY 1 - OUTCOMES 1

Invite a Revenue Department representative to the class to explain why income taxes are a necessity in our society, who plan income taxes, and how they are collected from individuals. Ask the representative to distribute materials that illustrate the meaning of terms such as "tax bracket," "short form," "long form," "personal exemption," and "W-2 form."

ACTIVITY 1 - OUTCOMES 1 (Cont'd)

Direct students in a research activity that will help them understand the kinds of services income taxes pay for and the procedures people use in paying their taxes. Advise students to visit an income tax office in the area and to interview a taxpayer in their family. Instruct students to include topics similar to the following in their reports to the class:

1. The kinds of services that are paid for by income taxes (Examples include defense, education, welfare and human services, space exploration, medical research, farm support, transportation, veterans pensions, government agencies, and federal housing.)

2. The meaning of personal exemptions and the types of exemptions claimed by the taxpayer in his or her family

3. The type of income tax form (long or short) used by the taxpayer in his or her family

4. The types of items included on the "long form" that are not included on the "short form"

5. The meaning of "tax bracket" and its relationship to the amount of taxes paid by an individual

6. The kinds of items included on a personal exemption form

Students should share their reports with the class.

ACTIVITY 2 - OUTCOMES 1 and 2

Since income tax laws and tables are changing rapidly, it is best to bring updated material to the classroom each year. An excellent guide entitled Understanding Your Taxes is available free from the IRS in any quantity. Contact the nearest IRS office. The information received will help students read tax tables and to complete income tax forms (Outcomes 1 and 2).

ACTIVITY 3 - OUTCOME 3

Introduce students to vocabulary associated with the assessment of property taxes: assessment rate, assessed value, and mill. Work an example with students similar to the following:

Example: John's house is valued at $45,000. The assessment rate is 18.456%. Find the assessed value of John's property. The tax rate in John's town is 36 mills per dollar of assessed value. Find John's tax to the nearest cent.

Solution: 45,000 x .18456 = $8,305.20 (assessed value)

8,305.20 x .036 = $298.9872

$298.9872 can be rounded to $299.99. (John's tax)

Have students work additional problems similar to the following:

1. Find the assessed value of property at $60,000 if the assessment is 20%, 15%, 8%.
2. 15 mills per dollar equals $____ per $100. $____ per $1,000
3. Figure the property tax at 27 mills per dollar on property worth $141,000 assessed at 21.675%.

ACTIVITY 4 - OUTCOME 4

Discuss the following taxes with students. Have them give additional examples and compute the different types of tax when appropriate.

Sales tax is made up of state, county, and local taxes on certain items. Sales tax varies from state to state and within the states from locality to locality. Point out that not only does the sales tax rate vary from state to state but also that which is considered taxable varies. For example, in many states food is not taxed, and in others, clothing is not taxed. At present writing, within the state of Alabama 4% of the sales tax goes to the state. The rest of the tax is dependent upon where one lives. In several instances, the county receives 1% sales tax, and a city or municipality within the county receives 2% for a total of 7%.

Example: In a rural area, the state tax is 4% and the county tax is 1%. Find the sales tax on taxable goods purchased totaling $43.50.

Excise tax is often considered to be a type of "use" tax. This means that the actual user of the goods or services is the one taxed. Excise taxes are found on transportation, such as airport departure taxes, gasoline, and tires. In some places manufacturers are taxed to assist in environmental purification.

Inheritance and Gift taxes go hand-in-hand with estate taxes and are interdependent. At the present time (1986), $500,000 given, inherited, or left as an estate is exempt from taxes. In 1987, $600,000 will be exempt from taxes. After the first $600,000, the amounts beyond are taxed at varied percentage rates from 18% on amounts from $0-$10,000 up to 55% on amounts greater than $3,000,000.

Use taxes have already been mentioned. These taxes put the burden of paying on the actual user. Toll roads and bridges are prime examples of use taxes.

Intangible taxes vary from state to state and, at present, do not exist in the state of Alabama. One type of intangible tax is property depreciation due to drilling or mining.

AREA: SWINDLES AND GYPS

OUTCOMES:
1. Identify methods or factors involved in deceptive or fraudulent advertising.
2. Identify methods or factors involved in deceptive or fraudulent pricing.

NOTES FOR THE TEACHER

These outcomes are best taught in conjunction with other areas throughout the Consumer Mathematics course. Deceptive or fraudulent advertising can be incorporated as a unit in the Consumer Credit area and also fits easily into the Money Management area in computing and comparing unit costs. Students might also learn these outcomes in a language arts unit related to recognizing and identifying various advertising techniques.

AREA: TRANSPORTATION

OUTCOMES:
1. **Compute the purchase price of an automobile.**
2. **Compute the cost of renting or leasing an automobile.**
3. **Compare costs for purchasing and/or leasing an automobile.**

NOTES FOR THE TEACHER

Prerequisites for Students

1. Add, subtract, multiply, and divide whole numbers, decimals, and percents.
2. Know how to compute interest.

Steps to Success

1. Interest rates and sales competition information regarding price and interest rates on autos and cost of leasing vary constantly. Local newspapers are excellent sources of up-to-date information.

2. The activities below consist primarily of student problems. Classroom discussions are needed also to make the problems have practical significance. For example, it is important to discuss the advantages of buying versus leasing. Students should also discuss the situations when buying would be most appropriate and the situations when leasing would be most appropriate.

ACTIVITY 1 - OUTCOME 1

Cut an ad similar to the following from the newspaper.

CAR FOR SALE				
Originally $16,750.00. Now only $12,750.00. (plus tax and title)	or	Payments as low as $250.00 a month for 60 months. ($800.00 cash down or trade)	or	7.5% 48 months financing

Discuss the ad so that the terms and options are understood. Then have students solve problems related to the ad similar to the following:

1. If one paid cash for the car, what variable costs would affect the final price? (tax, title, license, dealer costs, etc.)
2. If the down payment and 60-month option were chosen, what would be the total cost of the car?
3. If the 48-month, 7.5% interest option were chosen, what would be the final cost?

ACTIVITY 2 - OUTCOMES 2 and 3

Tell students that an ad similar to the following appeared in a newspaper.

Sixty-month lease with $300 refundable security deposit and one month pre-payment due at lease inception.

TYPE	PAYMENT	MILEAGE ALLOWED	NO. OF MONTHS	SECURITY DEPOSIT	1ST MONTH PAYMENT	DUE AT LEASE INCEPTION	TOTAL OF PAYMENTS
M-CAR	$107.45	60,000	48	$300.00	$107.45	$407.45	$ 5,157.60
R-CAR	$156.95	75,000	60	$300.00	$156.95	$456.95	$ 9,417.00
C-CAR	$269.62	75,000	60	$300.00	$269.62	$569.62	$16,177.20

Discuss all aspects of the ad so that students understand the meaning. Then, based on the ad, have students solve problems similar to the following:

1. If the M-car could be purchased for $4,500 at 8% interest over 4 years, what would be the final cost of the car? What would be the difference in the total lease cost and the total purchase cost?

2. If the R-car is rented for 24 months, what would be the cost of the lease?

3. If the R-car could be purchased for $9,600 at 7 1/2% interest and financed over 4 years, what would be the purchase price of the car? How would that compare to leasing the R-car for 4 years?

AREA: TRANSPORTATION

OUTCOMES:
4. **Identify factors that influence the operating cost of an automobile.**
5. **Compute the cost of gasoline in the operation of an automobile.**
6. **Compute the cost of repairs and upkeep of an automobile.**

NOTES FOR THE TEACHER

Prerequisites for Students

1. Add, subtract, multiply, and divide whole and decimals numbers.
2. Convert percents to decimals.

Step to Success

1. Since gasoline and repair costs vary greatly with locality and demand, it will spur the students' interest if the most recent figures from a given locality are used in problems and discussions.

ACTIVITY 1 - OUTCOMES 4, 5, and 6

Explain the following fixed and variable costs of owning a car:

Fixed	Variable
insurance	gas and oil
depreciation	repairs
car payment	tires
*parking	maintenance

* Explain that in some areas of the country, parking is a fixed cost. Ask students to add to the list of costs.

ACTIVITY 1 - OUTCOMES 4, 5, and 6 (Cont'd)

After initial instruction, have students solve transportation problems similar to the following:

Example 1: Mr. Hall bought a new car for $8,650. After using it for 3 years, he sold it for $5,400. What was the average yearly depreciation of his car?

Example 2: Sam took a trip. How much was the cost of gas and oil if he bought 57 gallons of gas at an average cost of $.87 per gallon and 2 quarts of oil at $1.40 a quart?

Example 3: Donna's car holds 15 gallons of gas. It averages 28 miles per gallon. If the average cost per gallon of gas is $.85, what is her weekly gas cost if she drives approximately 350 miles?

Example 4: Find the total cost of the following bill:

24,000 mile check-up	$109.00
replacement hose	9.50
replacement filters (3 filters for $12.08, $6.18, and $1.85)	
spark plugs (6 at $1.75 each)	
oil (4 quarts at $1.45 each)	
labor	54.00
Sub total	
tax (7% on everything except check-up and labor)	
Total	

AREA: TRANSPORTATION

OUTCOMES:
7. **Identify the types of automobile insurance.**
8. **Compute the cost of automobile insurance.**

NOTES FOR THE TEACHER

It is important when buying automobile insurance to understand the meaning of the terminology involved. When students understand the terminology, they can better decide what type insurance coverage they need. Once they determine the type of insurance needed or wanted, they can decide what type they can afford, if they are given the rates.

Review the following terms:

Liability pays costs of injury and property damage to the other driver.

Comprehensive pays costs of damage in case of unusual happenings such as theft of car, damage by burglary, replacement of stolen items, and weather damage or fire.

Collision pay costs of damage to a car if it is involved in an accident.

Uninsured motorist pays costs of damage if a car is hit by an uninsured motorist.

50/100/25 liability means that if an accident is the driver's fault, there is:

$50,000 maximum medical coverage for the first person injured in the other car;

$100,000 maximum medical coverage for all injured persons; and

$25,000 maximum property damage to the other's property.

ACTIVITY 1 - OUTCOMES 7 and 8

Provide students with a sample six-month premium rate chart similar to the following:

	Under 25		Over 25
	Male	Female	Male or Female
50/100/25 Liability	$180.20	$100.00	$75.50
Comprehensive	$100.60	$ 55.20	$39.40
$100 Deductible Collision	$200.75	$120.00	$80.60
Uninsured Motorist	$ 5.00	$ 5.00	$ 5.00
$10,000 Medical	$ 22.50	$ 14.00	$10.00

Have students use the rate chart to compute the cost of yearly premiums for individuals in the following categories:

1. Twenty-year-old male buying all five kinds of insurance
2. Twenty-six-year-old female buying all five kinds of insurance
3. Forty-five-year-old male buying all but collision
4. Eighteen-year-old female buying all but collision and medical

AREA: TRANSPORTATION

OUTCOMES: 9. List advantages and disadvantages of traveling by plane, train, and bus.
10. Identify and compute costs associated with trip planning.

NOTES FOR THE TEACHER

Point out that there are many ways to travel other than by automobile. It may be appropriate for students to have general knowledge of many types of transportation (bus, rapid transit, airplane, boat, bicycle, taxi). Class work on this topic will be more relevant if students conduct research projects on modes of transportation that are found in their city or town or in nearby cities and towns.

ACTIVITY 1 - OUTCOME 9

Divide the class into small groups. Assign each group a form of transportation (other than automobile) that is available in the area and that can be studied. Have each group investigate and report on the form of transportation that it is assigned.

Prior to their study, tell students they should gather information that illustrates the advantages and disadvantages of that modes of transportation; samples of schedules; examples of regular fares; and descriptions of special fares.

ACTIVITY 2 - OUTCOME 10

Divide the class into small groups. Each group must decide upon a fictitious vacation that it is to plan for and compute the cost of. Suggest that students go to a travel agent for information; visit the local Chamber of Commerce seeking travel information; and/or read the travel section from the Sunday newspaper.

Prior to the investigation have each group submit a brief description of the vacation. At this stage in their planning, have students be specific about the place(s) to be visited, the length of stay, the number of persons making the trip, and the expected costs. It is important for teachers to review group plans and to confirm that

ACTIVITY 2 - OUTCOME 10 (Cont'd)

there will be sufficient variety in the types of vacations planned and that students are thorough in their identification of expected expenses.

Final reports should include items similar to the following:

1. Place(s) to be visited
2. Length of stay
3. Persons making trip
4. All expected costs (transportation, lodging, food, tips, and sight-seeing fees)
5. Total cost of vacation
6. Cost per person, per day

Ask each group to consider if there is an alternate mode of transportation for their trip. If so, describe how the alternate form of transportation would affect costs. Describe also the advantage/disadvantages of that alternate form of transportation.

MATHEMATICS: CONSUMER MATHEMATICS AREA: Banks and Their Services

COS		ORIGINAL SOURCES	STUDENT OUTCOMES	BAS	STAN	ADV
*		Types of banks	1. Distinguish among commercial banks, savings and loan associations, investment banks, and credit unions.			
*		Bank services	2. Describe and demonstrate knowledge of basic services such as checking and savings accounts.			
			3. Compare interest rates on savings accounts.			
			4. Determine charges or interest on checking accounts and special features such as overdraft protection and incentive-based accounts.			

MATHEMATICS: CONSUMER MATHEMATICS AREA: Consumer Credit

COS		ORIGINAL SOURCES	STUDENT OUTCOMES	BAS	STAN	ADV
*		Use of credit	1. Compute interest.			
			2. Identify advantages and disadvantages of using credit.			
*		Kinds of credit plans	3. Compute the cost of credit for interest bearing charge accounts and identify any fixed costs associated with the credit plans studied.			
*		Cost of consumer credit	4. Compare cash versus credit purchases.			
*		The credit contract	5. Identify or list consumer responsibilities associated with credit, i.e., liability for consumer purchased items, stolen card responsibility, etc.			
*		Legal aspects				

MATHEMATICS: CONSUMER MATHEMATICS AREA: Housing

COS		ORIGINAL SOURCES	STUDENT OUTCOMES	BAS	STAN	ADV
*		Purchase of a house, condominium, and mobile home	1. List advantages and disadvantages of renting versus buying. 2. Compute costs of mortgages at different rates for different time frames. 3. Investigate and compute maintenance and upkeep costs of houses, mobile homes, and condominiums. 4. Investigate and compute utility costs.			
*		Renting of a house, apartment, and mobile home	5. Examine simple lease contracts. 6. Compute annual rent costs.			

MATHEMATICS: CONSUMER MATHEMATICS AREA: Insurance

COS		ORIGINAL SOURCES	STUDENT OUTCOMES	BAS	STAN	ADV
*		Basic kinds of insurance	1. Explain the purposes of health, life, and home insurance.			
*		Purchase of insurance	2. Compute costs of different types of insurance.			
			3. Compute costs of different kinds of life insurance.			
			4. Compute costs of home insurance.			

MATHEMATICS: CONSUMER MATHEMATICS AREA: Probability and Statistics

COS		ORIGINAL SOURCES	STUDENT OUTCOMES	BAS	STAN	ADV
*		Probability	1. Apply probability of events to relative experiences. (For example: weather, insurance, charts for life expectancy.)			
			2. Compute the relative frequency or probability of an event.			
*		Statistical data Collection	3. Compute the probablity of independent and dependent events.			
			4. Describe and use various methods of collecting data.			
		Analysis	5. Define and compute the four basic measures of central tendency: mean, mode, median, and range.			
			6. Compare and contrast the ways in which mean, mode, and median can be used to alter the presentation of data.			

MATHEMATICS: CONSUMER MATHEMATICS AREA: Money Management

C OF S		ORIGINAL SOURCES	STUDENT OUTCOMES	B A S	S T A N	A D V
*		Income	1. Compute and compare hourly, weekly, monthly, and annual salaries.			
			2. Identify various types of salary deductions: social security; federal, state, and local income taxes; union/professional dues; and insurance.			
			3. Compute net pay.			
*		Budgets	4. Identify areas that should be included in budgets: housing, utilities, food, clothing, transportation, insurance, savings, and recreation.			
			5. Develop a budget.			
*		Buying practices	6. Compute and compare unit costs.			
*		Consumer protection	7. Read and analyze various warranties and guarantees.			

MATHEMATICS: CONSUMER MATHEMATICS AREA: Savings and Investments

COS		ORIGINAL SOURCES	STUDENT OUTCOMES	BAS	STAN	ADV
*		Savings	1. Compute simple and compound interest on savings accounts.			
			2. Compare interest earned on savings bonds, certificates of deposit, and money markets.			
*		Investments	3. Have an awareness of various types of investments such as stocks, bonds, land, antiques, art, and jewels.			

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MATHEMATICS: CONSUMER MATHEMATICS AREA: Taxes

C OF S		ORIGINAL SOURCES	STUDENT OUTCOMES	B A S	S T A N	A D V
*		Federal income tax	1. Read tax tables.			
*		State income tax	2. Complete income tax forms.			
*		Property taxes	3. Compute property taxes.			
*		Other taxes: sales, excise, inheritance, gift, use, and intangible	4. Identify and compute various taxes.			

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MATHEMATICS: CONSUMER MATHEMATICS AREA: Swindles and Gyps

COFS		ORIGINAL SOURCES	STUDENT OUTCOMES	BAS	STAN	ADV
*		Deceptive advertsing	1. Identify methods or factors involved in deceptive or fraudulent advertising.			
*		Deceptive pricing	2. Identify methods or factors involved in deceptive or fraudulent pricing.			
*		Business opportunity schemes				
*		Home improvement schemes				
*		Referral schemes				
*		Vacation schemes				
*		Games of chance				
*		Charity collections				
*		Self-improvement schemes				

MATHEMATICS: CONSUMER MATHEMATICS — AREA: Swindles and Gyps (Cont'd)

COS		ORIGINAL SOURCES	STUDENT OUTCOMES	BAS	STAN	ADV
*		Flimflam				
*		Worthless stocks and bonds				
*		Land sales				
*		Family swindles				

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MATHEMATICS: CONSUMER MATHEMATICS — AREA: Transportation

COS		ORIGINAL SOURCES	STUDENT OUTCOMES	BAS	STAN	ADV
*		Personal transportation				
		Purchasing, leasing and renting a vehicle	1. Compute the purchase price of an automobile.			
			2. Compute the cost of renting and/or leasing an automobile.			
			3. Compare costs for purchasing or leasing an automobile.			
		Continuing costs	4. Identify factors that influence the operating cost of an automobile.			
			5. Compute the cost of gasoline in the operation of an automobile.			
			6. Compute the cost of repairs and upkeep of an automobile.			
		Insurance	7. Identify the types of automobile insurance.			
			8. Compute the cost of automobile insurance.			

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MATHEMATICS: CONSUMER MATHEMATICS AREA: Transportation

COS		ORIGINAL SOURCES	STUDENT OUTCOMES	BAS	STAN	ADV
*		Trip planning	9. List advantages and disadvantages of traveling by plane, train, and bus.			
*		Specialized recreational vehicles	10. Identify and compute costs associated with trip planning.			